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NRO REVIEW COMPLETED

30 March 1962

MEMORANDUM FOR THE RECORD

SUBJECT : CORONA Program Proposals

1. PURPOSE: LMSC in conjunction with Itak have proposed a series of programs for next year. It is my understanding that one of these, Project (LANYARD) [ ] has been approved. The purpose of this paper is to outline the general parameters of these proposals for those concerned.

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2. GENERAL: Under the CORONA program, the following proposals were made (all based on SO-132 film, the Mark 5A recovery system, and the Thor-Agena combination with some requiring THORAD for additional thrust):

(a) MURAL: Additional copies of our present system with two each 24" focal length, f/3.5, 70mm convergent stereo systems could be purchased. This system would include not only the 70mm auxiliary frame camera, but also a 35mm stellar camera. It is my understanding that the stellar-auxiliary frame camera combination can possibly ready by the last three MURAL launches in the present series (M-14, M-15, and M-16) and that the USAF has authorized about [ ] for this development. This item could easily meet the follow on order for six additional systems to bring the total available payloads to 22. This combination would consist of the present auxiliary frame camera with a separate 35mm stellar camera with an f/1.9, 75mm focal length Cannon lens with about a one inch circular format. This stellar camera would be mounted on a rigid 90° bracket to maintain the angular relationship to plus or minus 1/4 minutes of arc.

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(b) MURAL-TWO (M-2): This proposal has two possible approaches to give a 40" focal length f/3.5 capability. The short range approach which could be available next year is a simple scale up of the present 24" Petzval lens in the same general configuration but using 5" film. This would require THORAD for the additional weight. A longer range proposal has been made to design a race-track movement for the 40" lens to provide stereo coverage with one lens and two 5" film paths. This could not be available before late 1963 or early 1964, but would not require THORAD.

(c) MURAL-THREE (M-3): This proposal is for a 48" f/4 convergent stereo system. I have no other data on this system, but assume it is a twin 5" film, camera generally configured like basic MURAL. It would require THORAD for the added weight.

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(d) [ ] (LANYARD) (R): This consists of a modified E-5 camera. (66" focal length, f/5 convergent stereo system with 7600° of 5" film.) Requires THORAD for a four day operation. Without THORAD a marginal capability is said to exist for one day operation. SETD and the Configuration Control Board feel that THORAD is a requirement or this system should not be considered.

3. THORAD ADVANTAGES: This is an "add-on" booster system which consists of three solid propellant rockets (2nd stage of "Blue Scout") which would give the THOR its initial lift-off. With the additional thrust available, it would be possible to carry an E-4 or even a combination ARGON-MURAL in the CORONA vehicle. The recovery system available space becomes the limiting factor on most capabilities.

4. PERFORMANCE COMPARISON: The theoretical limits of these systems at a four to one contrast from 130 nautical miles with SO-132, no IMC error, and perfect exposure are about as follows:

<u>System</u>	<u>Focal Length</u>	<u>Ground Resolution</u>
M	24"	9.4 feet
M-2	40"	5.7 feet
M-3	48"	4.8 feet
R	66"	3.7 feet

5. ACTION REQUIRED: The Agency's role in CORONA/MURAL is clear, but clarification of roles and mission is needed on M-2, M-3 and R.

cc: NPIC

DFD/DB/ [ ]

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